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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,477	01/05/2006	Kimoon Kim	1751-394	1349
6449 7590 03/12/2009 ROTHWELL, FIGG, ERNST & MANBECK, P.C. 1425 K STREET, N.W. SUITE 800 WASHINGTON, DC 20005				
EXAMINER				
HAQ, SHAFIQTUL				
ART UNIT		PAPER NUMBER		
1641				
NOTIFICATION DATE		DELIVERY MODE		
03/12/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

Office Action Summary

Application No.

10/563,477

Applicant(s)

KIM ET AL.

Examiner

SHAFIQU HAQ

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- _____ Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- _____ Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-3, 5-9 and new claims 10-12 are pending. Amendment of claim 1 by incorporation of "solid substrate" of claim 4 in claim 1, now necessitated rejoining claims 5-9 which was previously withdrawn as being directed to non-elected species. Claims 5-12 are dependent on the solid support bound compound of Formula 1, which commensurate with the scope of claim 1 and thus claims 1-3 and 5-12 are examined on merits in this office action.

Rejections Withdrawn

2. Applicant's arguments, see pp8-9, filed on December 24, 2008, with respect to the rejection under 35 U.S.C. 103(a) as being unpatentable over Le *et al* (Agnew. Chem. Int. Ed. 2001) have been fully considered and are persuasive. The rejection of claims 1-3 under 35 U.S.C. 103(a) as being unpatentable over Le *et al* has been withdrawn in view of amended claim 1 in the reply filed on December 24, 2008 because Le *et al* fail to disclose or suggest the compound of Formula 1 is attached to a solid substrate with a predetermined spacing.

Claim Rejections - 35 USC § 112

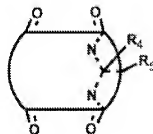
3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-3 and 5-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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5. Claim 1 recites "cucurbituril or its derivative of formula 2" in lines 9-10. It is unclear what derivatives of cucurbituril is represented by "formula 2" because the structure of formula 2 is missing in the claim. Further, it is unclear what



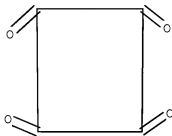
chemical compound is represented by the structure

in the compound of formula 1. The claim must clearly define the compound represented by above structure in order to clearly claim Applicants' invention.

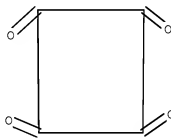
6. Claim 1 recites "wherein the compound of Formula 1 provides a linkage layer with a predetermined spacing in the biochip by being bonded to the solid substrate" in last two lines. The attachment point of the compound of formula 1 (i.e. functional group) to the solid substrate is unclear because amended claim 1 recites that Y_1 is a functional group for linkage with a biomaterial comprising a gene or a protein and Y_2 is a functional group but does not clearly describe which group is involved for bonding to solid substrate.
7. Claim 3 recites "the solid substrate of claim 1, which is selected from the group consisting of compounds of Formulae 5 through 13" in lines 1-3. In the solid substrate as claimed in claim 1, the compound of Formula 1 is bonded to the solid substrate, but the solid substrate represented by Formulae 5 through 13 as claimed in claim 3 do not show the compound attached to any solid substrate and thus the point attachment of the compound of Formula 1 compound to the solid substrates of claim 3 is vague and indefinite. Further,

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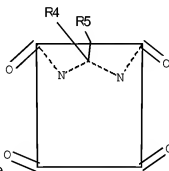
claim 3 discloses several compounds having a structure as shown below in the middle of the compounds:



. It is unclear what compound is represented by the above drawing/structure. The claim must clearly define the compound represented by the drawing/structure as shown above in order to clearly describe the compound Applicants are intended to encompass. Further, it is



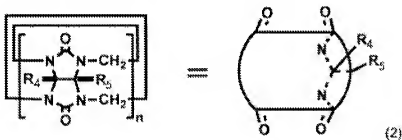
confusing as to whether the drawing/structure in this



claim and the drawing/structure in claim 1 represent the same compound or a different compound as there are some additional groups (N, R4, R5) attached to the drawing/structure in claim 1 but not in the drawing/structure in claim 3.

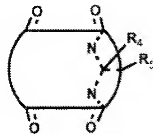
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8. Claim 7 recites "a gene chip comprising the solid substrate of claim 1". The solid substrate of claim 1 is not described as attached to any gene and thus the relationship of the gene with respect to the solid substrate of claimed "gene chip" in the claim is vague and indefinite.
9. Claim 8 recites "a protein chip comprising the solid substrate of claim 1". The solid substrate of claim 1 is not described as attached to any protein and thus the relationship of the protein with respect to the solid substrate of claimed "protein chip" in the claim is vague and indefinite.
10. Claim 9 recites "a sensor comprising the solid substrate of claim 1". The solid substrate of claim 1 is not described as attached to any protein, gene or biomaterial and thus it is unclear what biomaterial assay Applicants' are intended to encompass by the claimed "sensor".
11. Claim 12 recites "cucurbituril or its derivative of Formula 2" in line 4 and in line 5, discloses two structures as shown below



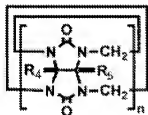
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It is unclear which one is designated as formula 2 compound. It appears



that Applicants intended to mean that the structure

represents the compound of formula 2 having the structure:



Further, it is unclear whether the compound of formula 2 represents cucurbituril or not, because the recitation "cucurbituril or its derivative of formula 2" is confusing. The language should be "cucurbituril or its derivative represented by Formula 2" , in order to clearly describe that the compound of formula 2 represents cucurbituril or its derivatives.

12. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

13. Claims 1-3 and 5-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement (New Matter). The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that

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the inventor(s), at the time the application was filed, had possession of the claimed invention.

The deletion of "compound of formula 3 below vertically passes through a cavity of the cucurbituril or its derivative of Formula 2" changes the scope of the orientation of the Formula 3 compound (i.e. $Y_1-R_1-X_1-R_2-X_2-R_3-Y_2$) with respect to cucurbituril or its derivative of Formula 2 and thus in the compound of Formula 1 of amended claim 1, the $Y_1-R_1-X_1-R_2-X_2-R_3-Y_2$ compound does not require to vertically pass through the cavity of cucurbituril or its derivative of Formula 2 and may be in any orientations, which does not have support in the specification. All through the specification the compound of formula 1 is described as comprising cucurbituril or its derivative of Formula 2 and a compound represented by formula $Y_1-R_1-X_1-R_2-X_2-R_3-Y_2$, wherein the compound $Y_1-R_1-X_1-R_2-X_2-R_3-Y_2$ vertically passes through the cavity of cucurbituril or its derivative of Formula 2 (see lines 5-7 of page 7) and wherein X_1 and X_3 are each independently a positively charged functional group, which interacts with oxygen atom of cucurbituril or its derivative of Formula 2 through an ion-dipole interaction (lines 12-13 of page 7). Therefore, Specification does not have support for any other orientation of the $Y_1-R_1-X_1-R_2-X_2-R_3-Y_2$ compound with respect to cucurbituril or its derivative of Formula 2 to form the compound of Formula 1.

Further, the amended claim 1 recites " Y_2 is a functional group", which does not require Y_2 as a functional group for a linkage with a substrate as claimed previously. This changes the scope of " Y_2 " as a functional group,

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which now can be a functional group reactive to biomaterials comprising gene or a protein or may be a non-reactive functional group. However, specification does not have support for Y_2 as any functional group. All through the specification scope of "Y2" is limited to functional group for a linkage with solid substrate, not for linkage to any compounds.

Therefore, the newly introduced limitations of claim 1 do not have support in the specification and thus is considered a new matter. New or amended claims which introduce elements or limitations which are not supported by the as-filed disclosure violate the written description requirement. See, e.g., *In re Lukach*, 442 F.2d967, 169 USPQ 795 (CCPA 1971).

Response to argument

14. Applicant's arguments and amendments filed 12/24/08 have been fully considered, and are persuasive to overcome the rejection of 7/24/08 under 35 USC 103 but the arguments and amendments are not persuasive to overcome the rejection under 35 USC 112 second paragraph because Formula 2 is not clearly defined in the claim 1. However Applicants' amendments necessitated new group of rejections under 35 USC 112 first paragraph and 35 USC 112 second paragraph as described in this office action.

Conclusion

15. No claims are allowed.

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16. Applicants' amendment necessitated new ground(s) of rejection presented in this office action. Accordingly, **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

If Applicants should amend the claims, a complete and responsive reply will clearly identify where support can be found in the disclosure for each amendment. Applicant should point to the page and line numbers of the application corresponding to each amendment, and provide any statements that might help to identify support for the claimed invention (e.g., if the amendment is not supported in *ipsis verbis*, clarification on the record may be helpful). Should Applicants present new claims, Applicants should clearly identify where support can be found in the disclosure.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shafiqul Haq whose telephone number is 571-272-6103. The examiner can normally be reached on 7:30AM-4:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark L. Shibuya can be reached on 571-272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Shafiqul Haq/
Examiner, Art Unit 1641